WHAT IS CLAIMED IS:

1. A level adjusting device for use with a near-end telephone, the near-end telephone being operable to generate an outgoing signal directed to a far-end telephone and to receive an incoming signal generated at least in part by the far-end telephone, the device comprising:

a first signal processor operable to dynamically adjust a first signal level associated with the outgoing signal with reference to the first signal level; and

a second signal processor operable to dynamically adjust a second signal level associated with the incoming signal with reference to the second signal level;

wherein the first and second signal processors are further operable to control a loop gain to inhibit loop instability.

2. The device of claim 1 wherein the first and second signal processors are operable to dynamically adjust the first and second signal levels in a plurality of bands.

3. The device of claim 2 wherein the plurality of bands comprises one of 2, 3, 4, and 5 bands.

4. The device of claim 2 wherein the plurality of bands are selected such that a range of frequencies associated with DTMF signaling is entirely encompassed within a single band.

5. The device of claim 1 wherein the each of the first and second signal processors comprises a static gain control component and a dynamic gain control component.

6. The device of claim 5 wherein the static gain component of each of the first and second signal processors is operable to set a static gain for each call, the static gain remaining unchanged for the duration of the corresponding call.

7. The device of claim 6 wherein the static gain is selected with reference to a dynamic range of the associated dynamic control component.

8. The device of claim 6 wherein the dynamic control component of each of the first and second signal processors is operable to dynamically adjust a dynamic gain for each call.

9. The device of claim 8 wherein the dynamic control component of each of the first and second signal processors is operable to dynamically adjust a plurality of dynamic gains for each call, each dynamic gain corresponding to one of a plurality of signal bands.

10. The device of claim 8 wherein the dynamic control component of each of the first and second signal processors comprises a wideband component and a multi-band component.

11. The device of claim 1 wherein the incoming and outgoing signals comprise analog signals.

12. The device of claim 11 wherein the analog signals conform to one of a US or international standard specification for connecting a telephone set to a telephone network.

13. The device of claim 11 further comprising circuitry for separating and combining the incoming and outgoing signals for processing by the first and second signal processors.

14. The device of claim 13 wherein the circuitry comprises first and second hybrids.

15. The device of claim 1 wherein the incoming and outgoing signals comprise digital signals.

16. The device of claim 15 wherein the digital signals conform to one of a plurality of specification for connecting a digital telephone set to a digital telephone network.

17. The device of claim 1 further comprising bypass circuitry operable to bypass the first and second signal processors.

18. The device of claim 17 wherein the bypass circuitry is operable to bypass the first and second signal processors until after the near-end telephone is determined to be off hook.

19. The device of claim 17 wherein the bypass circuitry comprises a twisted pair of conductors and a pair of relays operable to switch between the twisted pair and the first and second signal processors.

20. The device of claim 1 further comprising a near-end echo canceller operable to reduce echo in the outgoing signal, and a far-end echo canceller operable to reduce echo in the incoming signal.

21. The device of claim 20 further comprising a near-end speech detector for detecting near-end speech and controlling the near-end echo canceller in response thereto, and a far-end speech detector for detecting far-end speech and controlling the far-end echo canceller in response thereto.

22. The device of claim 1 wherein the first and second signal processors are operable to control the loop gain by decreasing at least one of a first gain associated with the first signal processor and a second gain associated with the second signal processor with reference to a combined gain which represents at least a portion of the loop gain.

23. The device of claim 22 wherein the first and second signal processors are operable to control the loop gain by decreasing the first gain when the outgoing signal does not correspond to outgoing speech energy, and decreasing the second gain when the incoming signal does not correspond to incoming speech energy.

24. The device of claim 22 wherein each of the first and second gains comprises a plurality of gain components each of which contributes to the combined gain.

25. The device of claim 24 wherein the first and second signal processors are operable to control the loop gain by decreasing only selected ones of the plurality of gain components.

26. The device of claim 24 wherein each of the gain components correspond to one of a static gain control block, a dynamic wideband gain control block, and a dynamic multi-band gain control block.

27. The device of claim 24 where the first and second signal processors are further operable to inhibit increases in selected ones of the gain components in the absence of speech energy.

28. The device of claim 22 wherein the combined gain includes a loss component determined with reference to the incoming and outgoing signals.

29. The device of claim 28 wherein the loss component comprises an estimate of an echo return loss.

30. The device of claim 29 wherein the estimate is determined with reference to a difference signal representative of a difference between a return energy signal corresponding to the incoming signal and an outgoing energy signal corresponding to the outgoing signal.

31. The device of claim 30 wherein the estimate deemphasizes speech energy in the incoming signal.

32. The device of claim 30 wherein when the difference signal exceeds the estimate, the estimate increases according to a time constant, and when the difference signal drops below the estimate, the estimate is adjusted to match the difference signal.

33. The device of claim 1 wherein the first and second signal processors comprise at least one computer readable medium having computer program instructions stored therein for effecting the dynamic adjustment of the first and second signal levels.

34. The device of claim 33 wherein the computer program instructions are operable to effect multi-band processing of an original sampled signal corresponding to one of the incoming and outgoing signals, the computer program instructions comprising:

first instructions for separating the original sampled signal into a plurality of signal components each corresponding to one of a plurality of frequency bands;

second instructions for independently and dynamically controlling a dynamic range associated with each one of the plurality of signal components;

third instructions for modifying at least one signal level associated with the plurality of signal components; and

fourth instructions for combining the signal components into a processed sampled signal.

35. The device of claim 34 wherein the first instructions separate the original sampled signal into one of 2, 3, 4, and 5 overlapping frequency bands.

36. The device of claim 34 wherein the second instructions effect nonlinear control of a gain factor associated with each of the signal components.

37. The device of claim 34 wherein the second instructions control the dynamic range associated with each of the signal components by applying a gain factor to each sample of each of the signal components, the gain factor being dynamically adjusted.

38. The device of claim 37 wherein the gain factor for each of the signal components is dynamically adjusted every first number of samples.

39. The device of claim 37 wherein the gain factor for each of the signal components is dynamically adjusted with reference to a threshold level to which each sample of each of the signal components is compared.

40. The device of claim 39 wherein the gain factor is adjusted upward using a release rate parameter where each sample is below the threshold level, and downward using an attack rate parameter where each sample is above the threshold level.